D0C08A/D0N27a/D0C29a KU Leuven
Fall 2009 Gerald Willmann

Homework # 1

due Nov 4

Problem 1: Consider the Stone/Geary utility function

$$u(x) = (x_1 - b_1)^\alpha (x_2 - b_2)^\beta (x_3 - b_3)^\gamma$$

Do the following exercises found in chapter 3 of MWG: 3.D.6 and 3.G.3.

Problem 2: A freshly minted KUL graduate has the utility function $U = \ln x_t + \beta \ln x_{t+1}$, where x_t is the consumption during her studies and x_{t+1} the consumption after graduation. Similarly, denote by e_t the income during her studies, and by e_{t+1} her income after graduation. Finally, let r be the interest rate between periods t and $t+1$.

a) Write down the budget constraint. Suppose that without studying she could have earned $(e_t = 200,000, e_{t+1} = 300,000)$. While studying, her income was only $e_t = 60,000$. The interest rate is 25 percent. How much does she have to earn after graduation to make her studies worthwhile.

b) Derive her uncompensated demands. Assume the same incomes and interest rate as in a) and suppose $\beta = 1.2$. Does she save or borrow during her studies?

c) The government offers her a subsidized loan at an interest rate of 10 percent. How high is the equivalent variation of this subsidy, i.e. what income subsidy during her studies would lead to the same additional utility.

Problem 3: You know that an individual's expenditure function is given by $E(p_1, p_2, U) = U p_1^\alpha p_2^\beta$.

a) What restrictions (if any) on the parameters α and β are required to ensure that $E(.)$ constitutes a valid expenditure function. Assume that the restriction(s) are/is satisfied.

b) Find the indirect utility function, the Hicksian demand functions, and the uncompensated demands. Carefully list the correct arguments for each function.

c) Use an alternative approach — i.e. different to what you did in b) — to calculate the uncompensated demand functions.

d) Are goods 1 and 2 complements or substitutes? Could it be otherwise? Please justify your answers.